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COMPLEX PARTIAL EPILEPTIC-LIKE EXPERIENCES IN UNIVERSITY STUDENTS AND PRACTITIONERS OF DHARMAKAYA IN THAILAND: COMPARISON WITH CANADIAN UNIVERSITY STUDENTS[1,2]

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Summary.—We tested the hypothesis that individuals who frequently practice meditation within another culture whose assumptions explicitly endorse this practice should exhibit more frequent and varied experience associated with complex partial epilepsy (without the seizures) as inferred by the Personal Philosophy Inventory and Roberts' Questionnaire for the Epileptic Spectrum Disorder. 80 practitioners of Dharma Meditation and 24 university students in Thailand were compared with 76 students from first-year courses in psychology in a Canadian university. Although there were large significant differences for some items and clusters of items expected as a result of cultural differences, there were no statistically significant differences between the two populations for the proportions of complex partial epileptic-like experiences or their frequency of occurrence. There were no strong or consistent correlations between the history of meditation within the sample who practiced Dharma meditation and these experiences. These results suggest complex partial epileptic-like experiences may be a normal feature of the human species.

Complex partial epileptic-like experiences, similar to those evoked by direct electrical stimulation within the temporal lobes of patients with histories of epilepsy, have been reported within the normal population who do not display epilepsy as defined by medical criteria (Makarec & Persinger, 1990). The experiences, that include periods of intense meaningfulness, vibrations or undulations moving through the body, or the presence of another consciousness or sentient being are correlated positively and moderately with suggestibility, creativity, imaginative (visualization) capacity, and intuition (Persinger & Makarec, 1991, 1993; Persinger, 1995a, 1995b). People who display higher scores for experiences that comprise the cluster of complex partial epileptic-like experiences are more likely to experience the presence of a sentient being when complex, frequency-modulated magnetic fields are applied over their right hemispheres (Cook & Persinger, 2001).

The scores for the basic clusters of complex partial epileptic-like experiences have not changed appreciably within populations of students enrolled

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in first-year psychology courses at Laurentian University for about two decades. Within this population, students who stated they had learned to meditate also reported more experiences of low frequency vibrations (similar to driving over a rolling road), hearing one's name called, paranormal phenomena, and profound feelings from reading poetry or prose. The present experiment was designed to obtain the scores for complex-partial epileptic signs from a sample of people who practiced Dharmakaya meditation in Thailand. This practice involves sitting in a particular upright position and imagining a sphere of light moving through the nose into the center of the forehead and then down into the heart where the person visualizes the Buddha to be. We predicted that the people who practice Dharmakaya should display more elevated scores for complex partial epileptic-like signs compared to either culture-related or nonculture-related (western) university students.

Method

Subjects

The subjects consisted of 80 practitioners of Dharmakaya, 24 university students from Thammasat University in Bangkok, and 76 first-year university students enrolled in psychology courses at Laurentian University in Sudbury, Ontario, Canada. About two-thirds of the sample for the meditators and the Canadian university students were women. There were equal numbers of men and women in the sample of Thai students. The median age of the university students was 23 yr., while the median age for the Dharmakaya practitioners was 40 yr. The median period of practice for the Dharmakaya participants was 5 yr. (range 1 month to 23 years). The median number of meditations per week was 5 (range 1 to 21), and the median duration of each meditation was 27 min. (range 5 min. to 2 hr.).

The 140 items from the Personal Philosophy Inventory (Makarec & Persinger, 1990; Persinger & Makarec, 1993) and the 36 items from Roberts' Questionnaire for the Epileptic Spectrum Disorder (Roberts, Varney, Hulbert, Paulsen, Richardson, Springer, Shepherd, Swan, Legrand, Harvey, Struchen, & Hines, 1990; Roberts, Gorman, Lee, Hines, Richardson, Riggle, & Varney, 1992) were translated into Thai by a professional translator. The content of some items were adjusted to a cultural equivalent. The data were collected during a visit to Bangkok, Thailand in late 1996 by the first author. For comparison, university students who were enrolled in first psychology courses during the years 1996 and 1997 were administered the Personal Philosophy Inventory and Roberts' inventory. For each group, the inventories were administered in a single setting to the whole group. The questionnaires were completed in the temple by the meditators, in the university courtyard by the Thai students, and in the classroom by the Canadian students.

The items were analyzed by SPSS software on a Vax Computer system to form the various clusters. For this study, we selected the clusters of items labelled complex partial epileptic-like signs, the temporal lobe profile, and the total scale (Makarec & Persinger, 1990; Persinger & Makarec, 1993) as well as those subclusters (three to four items each) that reflect various aspects of experiences associated with stimulation of the amygdala and the hippocampus in epileptic patients. Scores for clusters of items we have labelled egocentrism, e.g., if there was an accident and only one person survived, it would be me), fears (earthquakes, mice), exotic beliefs (aliens are responsible for UFOs), and traditional religious beliefs were also calculated. For the clusters from the Personal Philosophy Inventory, the number of yes responses or their equivalent were summed (0 = no, 1 = yes), divided by the number of items in a cluster, and multiplied by 100. For Roberts' inventory, each item contained a score between 0 and 6. These integers and their indicators were 0: never, 1: less than once per month, 2: about once per month, 3: once per week, 4: more than once per week, 5: once per day, and 6: more than once per day. The scores for all 36 items were summed for the Total Roberts Score.

Results

The means and standard deviations for the various clusters of items from the Personal Philosophy Inventory are shown in Table 1. Given the ω^2 estimates, that reflect the amount of variance in the dependent variable accommodated by group differences, were considered more informative than probability levels, these indicators are shown as well. Degrees of freedom were 2,177.

There were no statistically significant differences (all Fs < 1.00) among the Canadian university students, the Thai university students, and the Dharmakaya practitioners for the Total Score for Roberts' inventory. There were also no statistically significant differences between the groups for the major clusters of items from the Personal Philosophy Inventory by which we infer temporal lobe sensitivity. Similarly, there were no significant group differences for the scores for egocentrism, fears/phobias, widening of affect, sensed presence, parapsychological experiences, or verbal meaningfulness during reading of prose/poetry.

Post hoc comparisons for the significant group differences for visual experiences ($F = 7.16$, $p < .01$) and auditory vestibular experiences ($F = 3.75$, $p < .05$) indicated that the Dharmakaya group reported proportionally more visual experiences than did the Canadian university students. Both Thai groups reported significantly fewer vestibular-auditory experiences than did the Canadian university students. *Post hoc* analyses of the significant differences in proportions of exotic beliefs ($F = 39.28$, $p < .001$) and religious beliefs ($F =$

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR SCORES FROM MAJOR CLUSTERS OF ITEMS FOR COMPLEX PARTIAL EPILEPTIC-LIKE SIGNS AND VARIOUS SUBCLUSTERS FROM PERSONAL PHILOSOPHY INVENTORY AND FOR TOTAL SCORES ON ROBERTS' CHECKLIST OF SYMPTOMS OF PARTIAL SEIZURES

Variable	University Students				Dharma Practitioners		
	Laurentian ($n=76$)		Thailand ($n=24$)		Thailand ($n=80$)		η^2
	M	*SD*	*M*	*SD*	*M*	*SD*	
Roberts' Questionnaire	35	19	36	16	31	31	<1%
Personal Philosophy Inventory (Major Clusters)							
CPES Experiences	39	21	38	22	39	21	<1%
TLS Cluster	41	16	39	17	36	19	1%
Complete Scale	43	13	42	15	42	11	
Beliefs							
Exotic Beliefs	55*	22	70†	14	80†	13	31%
Religious Beliefs	36*	17	57†	16	62†	16	39%
Fears/Phobias	48	24	49	22	47	22	<1%
Egocentricism	44	17	42	15	42	15	<1%
Subclusters of Temporal Lobe Experiences							
Paranormal Experiences	48	28	52	23	50	28	<1%
Verbal Meaningfulness	37	32	47	32	48	33	<1%
Widened Affect	56	28	56	27	65	27	<1%
Visual Experiences	25*	26	33	19	42†	31	7%
Auditory-Vestibular	41*	30	27	29	28†	29	4%
Sensed Presence	33	30	25	28	35	34	<1%

56.34, $p<.001$) indicated that both Thai groups endorsed significantly more of these items for both clusters of beliefs relative to Canadian university students.

To help evaluate the validity of our results, we analyzed the percentage of participants from each group that answered yes to each of the 140 items. Examples of these items are presented in Table 2. In general, there were no statistically significant differences among any of the three groups with respect to the incidence of common experiences such as feelings of anger. The primary differences between the Thai and Canadian groups involved items that referred to the importance of the self, beliefs in allegedly nonphysical processes, and assumptions endemic to eastern philosophies.

The correlation coefficients (r) between the Total Score for the Roberts' Questionnaire and the score for the cluster of complex partial epileptic-like signs from the Personal Philosophy Inventory for the Canadian university, Dharmakaya, and Thai university students were .68, .72, and .32, respectively. All but the latter coefficient were statistically significant ($p<.01$). There were no statistically significant correlations ($rho<.10$) between the Total Score or Roberts' inventory and either the duration of practice (in months) or the number of minutes practiced per day. However, a weak correlation

TABLE 2
PERCENTAGE OF POPULATION REPORTING YES TO SAMPLE ITEMS FROM PERSONAL PHILOSOPHY INVENTORY FOR THREE POPULATIONS

Question	Laurentian University	Thailand	Dharmakaya
5. Legs feeling weak when angry	26	29	22
7. Feeling better after writing prose/poetry	47	33	39
10. Evidence of life on other planets	43	46	44
13. Fear of earthquakes	49	42	43
14. I like to buy new things	97^{cb}	25^{c}	20^{b}
17. Inner voice told where to find something	45	54	45
19. Rather go to priest than psychologist	25^{a}	29^{b}	72^{ab}
21. During childhood knocked unconscious	40^{ab}	4^{a}	3^{b}
27. Awaken during sleep and cannot move	18	21	24
31. Belief in Science and Religion not compatible	34	50	49
40. Sign will be given for tough decision	29^{ab}	54^{a}	76^{b}
44. I would like to time travel	78	88	87
64. I am no different than anyone else	32^{ab}	71^{a}	82^{b}
72. I am afraid of mice	20	42	23
76. Heard inner voice call name	20	17	28
94. Telepathy is real	74^{ab}	95^{a}	95^{b}
99. Animals should not be killed for mankind	49^{ab}	79^{a}	93^{b}
104. May have lived a previous life	39^{ab}	54^{b}	86^{b}
110. Dreams of flying once a year	49	46	40
128. People should be guided for their spiritual development	36^{b}	96^{a}	89^{b}

$^{abc}p < .01$ within rows.

(*rbo* = .26) was noted between the number of meditations per week and the Total Score.

To ensure the consistency of the present sample of first-year Canadian university students with previous groups that showed enhanced complex-partial epileptic-like signs in individuals who reported they had practiced meditation (Persinger, 1993), the 21 subjects in this sample who reported they had learned to meditate were compared to these 55 subjects who reported they had not. One-way analyses of variance were completed for the same variables. There were statistically significant differences ($df = 1,74$) between the meditators and nonmeditators for scores for the clusters that defined the complex partial epileptic-like scale ($F = 7.37$, $p < .01$) and the total scale ($F = 4.96$, $p < .05$). The means for the meditators for these scales were 48 ($SD = 17$) and 48 ($SD = 11$), while for the nonmeditators the values were 35 ($SD = 18$) and 41 ($SD = 1$), respectively. The meditators also endorsed significantly ($p < .01$) greater proportions of paranormal experiences ($F = 8.77$, $p < .01$), visual experiences ($F = 4.00$, $p < .01$), auditory experiences ($F = 6.94$, $p < .01$), and sensed presence ($F = 10.88$, $p < .01$) compared to nonmeditators.

We examined each item of Roberts' inventory and found that the Cana-

dian students who had meditated reported more frequent episodes ($M=2.9$, $SD=1.6$) for seeing things in the peripheral vision ($F=6.04$, $p<.01$) and more frequent episodes of missing sections of television shows ($M=1.5$, $SD=1.5$), i.e., memory lapses ($F=11.51$, $p<.001$) compared to those who had not meditated ($M=2.0$, $SD=1.2$ and $M=0.6$, $SD=0.8$, respectively). When we divided the Dharmakaya practitioners into four groups, those who had practiced for 0 to 16 months, 17 through 60 months, 61 through 108 months, or more than 108 months, the only item with a significant group difference ($F_{3,77}=2.77$) was the incidence of seeing things in the peripheral visual field. The means and standard deviations for the four groups in ascending order of months of meditation practice were .8 (1.5), .9 (1.5), 1.1 (1.9), and 2.2 (2.5). Except for weak linear (dfs=3,76) increases in the proportion of paranormal experiences ($F=2.65$) and egocentric reference ($F=4.48$), as a function of the duration of practice, the other variables shown in Table 1 did not display statistically significant group differences.

Discussion

The results of this study did not support our hypothesis that individuals who practice a meditation procedure would report more complex partial epileptic-like experiences. We were surprised by the absence of statistically significant differences for the proportions of these experiences, as inferred by two different inventories with separate psychometric assumptions, between Dharmakaya practitioners, Thai university students, and Laurentian University students. With the exception of a weak correlation between the numbers of meditations per week and the Total Score for Roberts' inventory for signs of complex partial epileptic-like seizures, there were no statistically significant associations between the duration of meditation practice and this cluster of experiences.

Previous studies (Persinger, 1993) had shown that individuals who engaged primarily in Transcendental Meditation reported more complex partial epileptic-like experiences. This internal consistency was replicated in the present study. One explanation for the elevated experiences for the Canadian students who had meditated but not the Dharmakaya group might involve the differential effects of different meditation procedures. Dharmakaya practitioners emphasize visualization, while Transcendental Meditators emphasize repetition of words or mantras. Alternatively, the effects of these techniques upon people from different cultures may be significant. That the Dharmakaya procedure may have increased the procedure-specific experiences (visualization) was indicated by the greater proportion of items referring to visual experiences endorsed by the Dharmakaya practitioners compared to university students. The confounding variable is that only those participants who *a priori* experienced more visual sensations might have felt

more successful and hence continued to practice this particular form of meditation.

The intrinsic validity of our conclusions was supported by the types of items that differentiated the Thai and Canadian populations. Experiences that likely reflect the intrinsic organization of the human brain, determined primarily by genetics, did not differ between the samples. All three groups contained comparable proportions of yes responses for dreams of floating, hearing an inner voice call one's name, and other indicators of awareness of experiences attributed to functional connections between the limbic system and the temporal and parietal lobes. The proportion of common fears, for earthquakes and mice, were also similar between the groups.

The primary differences between the Thai and Canadian participants occurred for items that would be consistent with cultural differences. More subjects from Thailand reported they believed they lived previous lives, felt that people should be guided for their spiritual development, considered telepathy was real, and did not endorse killing animals for the sake of mankind. Likewise, fewer Thai subjects felt they were special and did not prefer to buy new things.

One of the purposes of this study was to obtain estimates of the proportions of complex partial epileptic-like experiences that are reported by people conditioned in other cultures in which beliefs and values very different from those generally held in western culture are emphasized. If the experiences we attributed to temporal and parietal lobe functions are intrinsic to the human brain, then their proportions should be similar despite differences in culture. Our results support this explanation.

Previous research has shown a consistent association between electrical lability and the capacity to experience phenomena that have been attributed to spirituality (Persinger, 1983, 1994). Here, spirituality is defined as the experience or conviction that the sense of self is associated with a larger, sentient process that occupies all of space and all of time. Although the etiology of unusual experiences attributed to a god or to spirituality are likely to reflect the intrinsic organization of the human brain (Persinger, 1983) and the artifacts of the nominal dimensions of language (Persinger, 1985), the rational understanding of these processes could allow their prediction and control.

Individuals with elevated complex partial epileptic-like experiences are more creative, intuitive individuals who experience phenomena that have been labelled as paranormal (Persinger & Makarec, 1987) in contemporary western culture. These individuals are also more sensitive to weak complex magnetic fields applied across the cerebrum (Cook & Persinger, 2001). We suggest that, if there is marked similarity of experiences cross-culturally related to complex partial or limbic epileptic seizures, there may be a common

configuration in the brain organization of all humans. Experimental stimulation of spiritual experiences and their development within the individual or larger groups of individuals might be facilitated by an electromagnetic technology (Persinger, 1995a, 1995b) that interacts with these configurations of the human brain and is consistent with the physical principles of contemporary neuroscience.

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